



The Future of Analog IC Technology®

# EVQ2451-G-00A

## 0.6A, 2MHz, 36V Step-Down Converter Evaluation Board

### DESCRIPTION

The EVQ2451-G-00A is an evaluation board for the MPQ2451, a fixed 2MHz frequency step-down switching regulator with an integrated internal high-side high voltage power MOSFET. The IC provides 0.6A output with current mode control for fast loop response and easy compensation.

High power conversion efficiency over a wide load range is achieved by scaling down the switching frequency at light load condition to reduce the switching and gate driving losses.

The soft-start function helps prevent inductor current runaway during startup and thermal shutdown provides reliable, fault tolerant operation.

By switching at 2MHz, smaller value inductor and input/output capacitor can be used to lower down cost and save board space.

### ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	8-36	V
Output Voltage	$V_{OUT}$	5	V
Output Current	$I_{OUT}$	0-0.6	A

### FEATURES

- Wide Operating Input Range
- Fixed 2MHz Switching Frequency
- 0.6A Output Current
- Up to 90% Efficiency

### APPLICATIONS

- High Voltage Power Conversion
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Battery Powered Systems

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

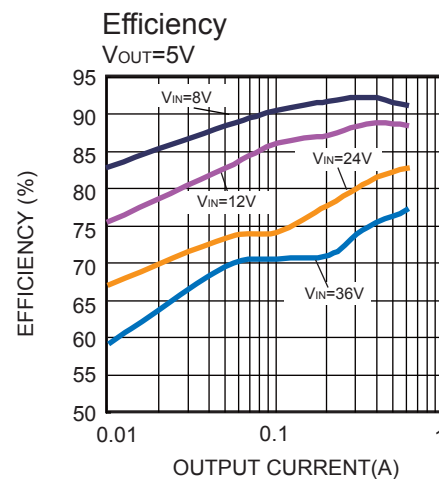
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### EVQ2451-G-00A EVALUATION BOARD

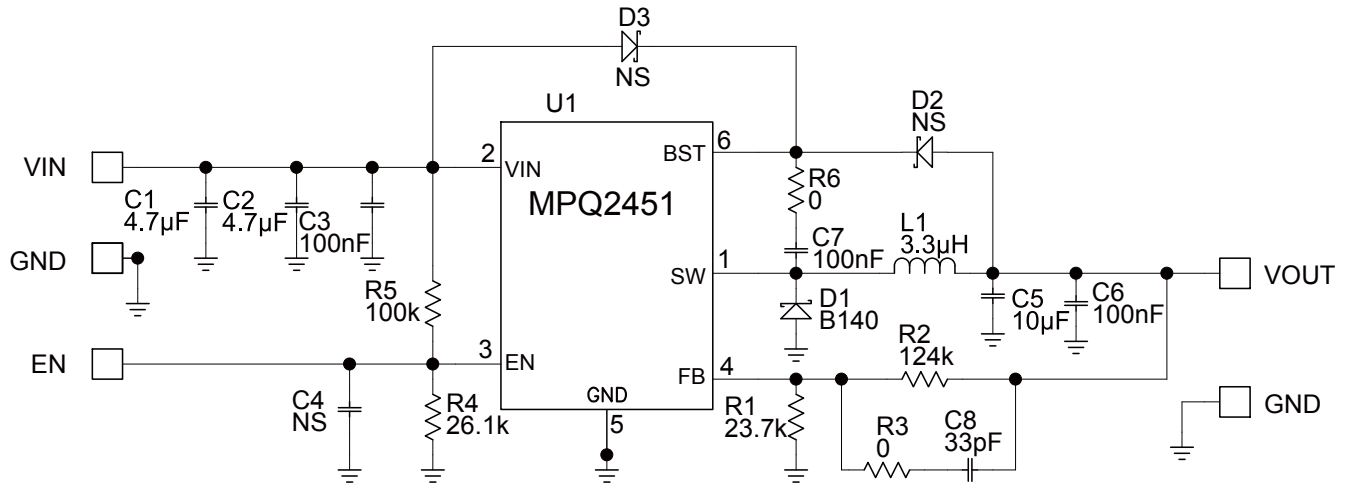


(L x W x H) 1.8" x 1.8" x 0.4"  
4.6cm x 4.6cm x 1.0cm

Board Number	MPS IC Number
EVQ2451-G-00A	MPQ2451-G



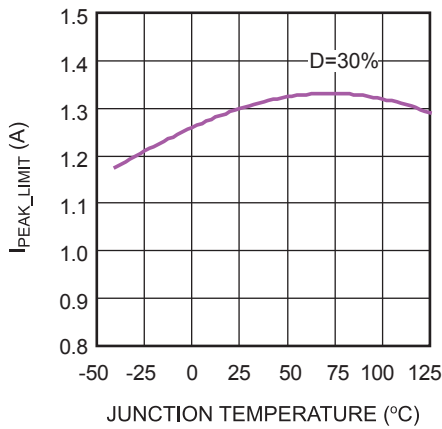
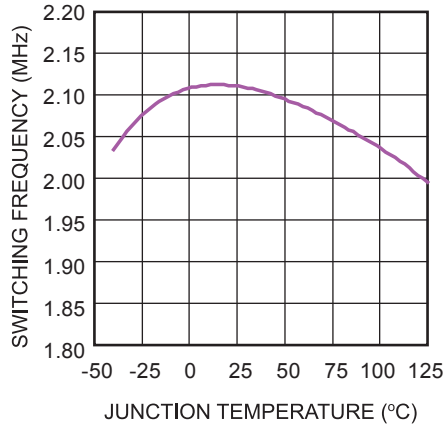
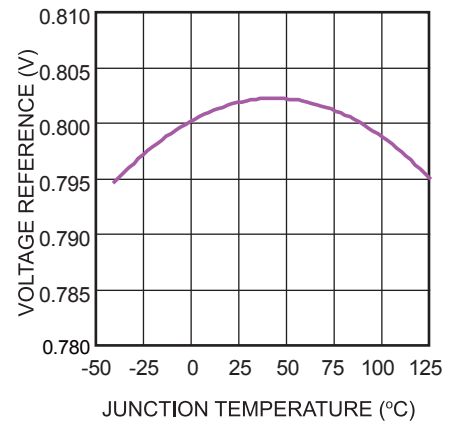
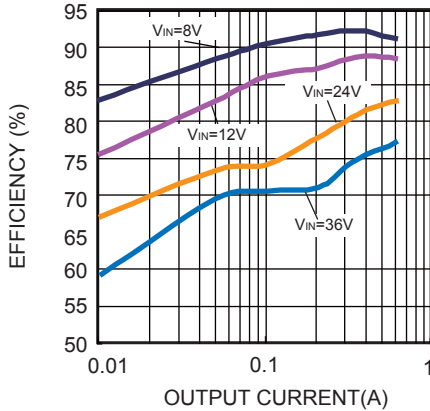
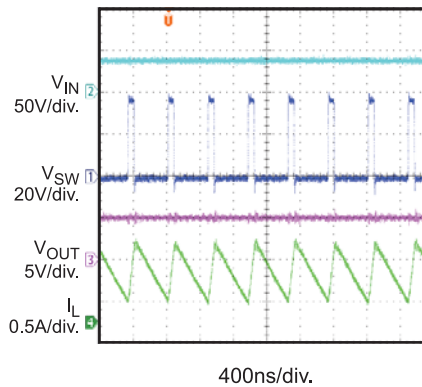
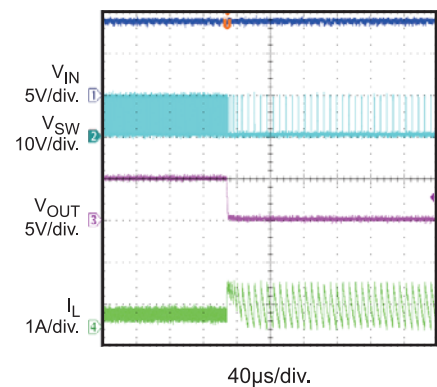
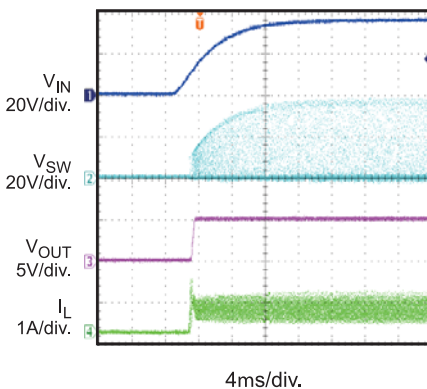
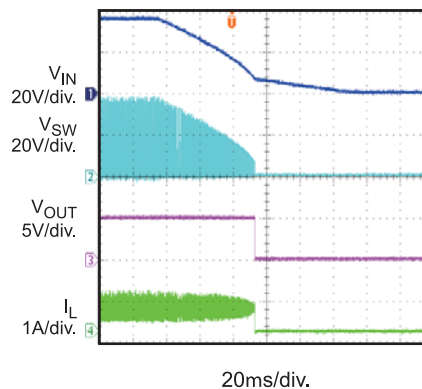
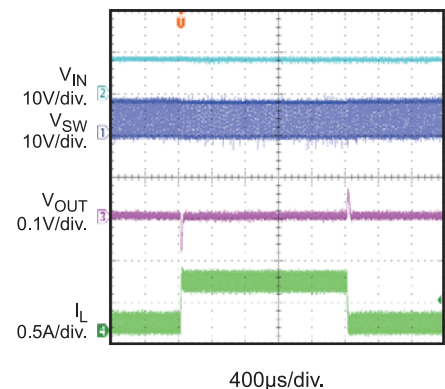
## EVALUATION BOARD SCHEMATIC



## EVQ2451-G-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	4.7µF	Ceramic Cap., 50V, 10%, X7R	1210	muRata	GRM32ER71H475KA88L
3	C3, C6, C7	0.1µF	Ceramic Cap., 50V, 10%, X7R	0603	muRata	GCJ188R71H104KA12D
2	C4, C8	NS				
1	C5	10µF	Ceramic Cap., 16V, 10%, X7R	1206	muRata	GRM31CR71C106KAC7L
1	D1	B140	Schottky Rect., 40V, 1A	SMA	Diodes Inc	B140-13-LF
2	D2, D3	NS				
1	L1	3.3µH	Inductor, I <sub>dc</sub> =2.15A, R <sub>dc</sub> =30mohm	SMD 5x5mm	Würth	WE-744043003
1	R1	23.7KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0723K7KL
1	R2	124KΩ	Film Res., 1%	0603	Yageo	RC0603FR-07124KL
1	R3	NS				
1	R4	26.1KΩ	Film Res., 1%	0603	Yageo	RC0603FR-0726K1KL
1	R5	100KΩ	Film Res., 1%	0603	Yageo	RC0603FR-07100KL
1	R6	0	Film Res., 5%	0603	Yageo	RC0603JR-070RL
1	U1	MPQ2451DQ	Power Led Driver	QFN6L-2X2mm	MPS	MPQ2451DQ
4	VIN, GND, VOUT, GND		Power Test Point	2.3mm	HZ	China market
1	EN, GND		3x2.54mm Test Point	3x2.54mm	Sullins	PCC03SAAN

## EVB TEST RESULTS

**Current Limit vs. Junction Temperature**

**Frequency vs. Junction Temperature**

**Voltage Reference vs. Junction Temperature**

**Efficiency**  
 $V_{OUT}=5V$ 

**Steady State**  
 $V_{IN} = 36V$ 

**Short Output**
 $V_{IN} = 8V, I_{OUT} = 0.5A$ 

**Power Ramp Up**
 $V_{IN} = 36V$ 

**Power Ramp Down**
 $V_{IN} = 36V$ 

**Load Transient**
 $V_{IN} = 8V, I_{OUT} = 0.1A - 0.6A$ 


## PRINTED CIRCUIT BOARD LAYOUT

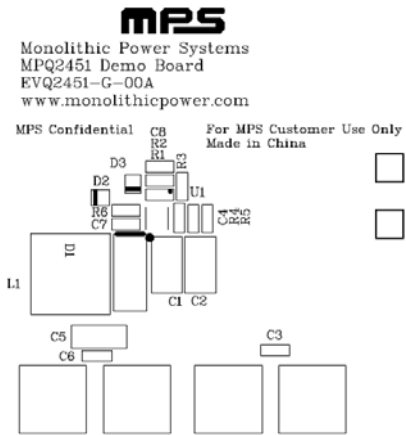


Figure 1—Top Silk Layer

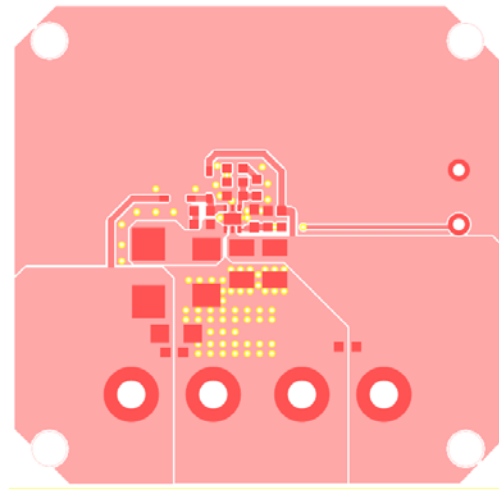


Figure 2—Top Layer

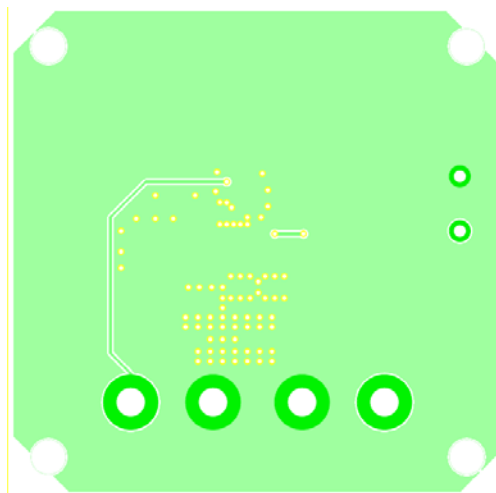


Figure 3—Bottom Layer